Factors Predicting Health Promoting Behaviors among Older Pregnant Thais

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Abstract: Societal changes in Thailand have caused individuals to marry later in life resulting in a rapid increase in the number of women becoming pregnant at older ages. Women becoming pregnant beyond 35 years of age are at a greater risk for poor pregnancy outcomes and, as a result, in need of good health practices. However, limited data exists regarding maternal factors associated with health promoting behaviors among older pregnant Thais. Therefore, the purpose of this prospective correlational study was to describe the relationships among maternal factors and health promoting behaviors in pregnant, older Thais.

The sample consisted of 142 pregnant Thais who were 35 years of age or older and attending antenatal clinics in four public hospitals in Thailand. Data were collected via the: Personal Characteristics Questionnaire; Perceived Benefits and Perceived Barriers of Health Promoting Behaviors Scale; General Self-Efficacy Scale; Interpersonal Relationship Inventory Questionnaire; and, Health Promotion Lifestyle Profile II Scale. Maternal outcomes were obtained from the subjects' medical records. The results revealed the women's health promoting behaviors were significantly associated with their level of education, perceived benefits of health promoting behaviors, self-efficacy and social support.

Regression analysis revealed self-efficacy, perceived benefits of health promoting behaviors and social support explained 49.3% of the variance in actual health promoting behaviors. The findings suggested, to improve health promoting behaviors among this at-risk population, there is a need for enhancement of self-efficacy and social support combined with education about the benefits of health promoting behaviors.

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Introduction

Pregnant women, who are 35 years of age and older, have been categorized as a high-risk group by obstetricians and gynecologists.[1] The focus of maternal, infant and child health services in Thailand has increasingly been on the care of this at-risk group. However, morbidity and mortality, particularly among older pregnant Thais, remain high.[2] Although

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the Ministry of Public Health in Thailand has initiated efforts to decrease the maternal death rate, 35.9% of pregnant Thais continue to be 35 years of age or older.[3] Among married Thai women, who are 15 to 49 years of age, 13.69% have been found to be over the age of 35 years.[2]

Prior studies have linked increasing maternal age with higher rates of maternal and infant complications.[4, 5] Poor health behaviors during pregnancy can further increase risks of maternal and infant problems. Among married pregnant Thais who consumed alcohol during pregnancy, 69% have been found to be 35 or older, while 31% were found to be younger than 35.[6] In addition, older pregnant Thais have been found to be nearly twice as likely not to receive prenatal care compared to younger women.[4] While identified as a "high-risk" group, little research has examined maternal factors associated with health promoting behaviors among older pregnant Thais.

Review of the Literature

Older pregnant women experience more frequent physical and psychological complications during pregnancy, compared to younger women, especially first-time pregnant women.[2] Pre-eclampsia is more common among older primiparas and gestational diabetes mellitus has been associated with increasing maternal age.[7, 8] Increased obstetrical risks in older pregnant women include: antepartum hemorrhage, miscarriage, caesarean sections, vaginal operative deliveries, and the need for induction and augmentation of labor.[9, 10] Furthermore, women who are pregnant at 35 years of age or older not only have obstetric complications (i.e. miscarriage, antepartum hemorrhage and premature contraction), but also experience frequent amniocentesis and assisted deliveries that lead to increasing health care costs.[11] In Thailand, older pregnant women, compared to younger women, have significantly increased risks for gestational diabetes mellitus, chronic hypertension, malpresentation, pregnancy induced hypertension, placenta previa, multiple pregnancies, preterm labor, fetal distress, postpartum hemorrhage and endometritis.[4, 5]

Older pregnant women also have a higher risk for poor psychological outcomes, such as stress, anxiety and depression.[12] This is especially true for those who have a higher risk of obstetrical history, such as infertility, prior perinatal loss and high-risk pregnancies.[13] In addition, older pregnant women may have greater psychological distress related to feelings of disappointment, guilt, anger, jealousy, and doubt as to their own abilities, including becoming a mother, conflict within the couple's relationship and practicing healthy behaviors.[12, 13] Previous research has suggested that mothers 35 years of age and older may be more likely to believe their babies might be harmed during labor because of their age.[14]

Studies conducted within Western populations have reported links between older maternal age and the risk of fetal complications.[15-17] Moreover, having children in later life can result in fetal and neonatal problems, including fetal death, preterm delivery, low birth weight, intrauterine growth retardation and newborn complications.[16, 18] Furthermore, older women have been found to have an elevated risk of stillbirth, preterm birth and neonatal intensive care unit admissions, regardless of parity.[19] Genetic abnormalities, such as Down Syndrome, are more common among babies born to women who become pregnant at 35 years of age or older.[20]

In Thailand, infants born at low birth weights among mothers age 35 years of age or older have remained about 12% higher than to women younger than 35 years of age.[2] Older pregnant Thais, compared to their younger counterparts, have been found to have more adverse fetal outcomes, including low birth weight, low Apgar scores and congenital anomalies.[4, 5]

The practice of health promoting behaviors is an important factor influencing good pregnancy outcomes.[21] In the Western world, factors associated with health promoting behaviors, among pregnant

women, have been found to include self-efficacy and knowledge about perceived benefits, and barriers to health promoting behaviors.[19, 22, 23] The question arises, what are the critical factors in the patterns of health promoting behaviors for older pregnant Thai women? Thus, based upon prior research and the lack of adequate information regarding health promoting practices among older pregnant Thais, the purposes of this study were to: a) describe the relationships among maternal factors and health promoting behaviors; and b) identify maternal factors that predict health promoting behaviors.

Method

Design: A prospective correlational design was used to investigate the relationship between maternal factors and health promoting behaviors in older pregnant Thais. A selected group of factors identified in the Health Promotion Model (HPM) were examined.[21] The independent variables were: personal factors (education, income, parity, marital status, smoking and alcohol consumption); perceived benefits of health promoting behaviors; perceived barriers to health promoting behaviors; perceived self-efficacy; and, social support. The dependent variable was health promoting behaviors.

Ethical Considerations: Approval to conduct the study was obtained from the Institutional Review Board of each of the researchers' academic institutions, at the time of data gathering, and from the Directors of the four public health hospitals used as data gathering sites. All potential subjects were informed about: the purpose of the study; what being in the study would involve; anonymity and confidentiality issues; and, the right to withdraw from the study, at any time, without repercussions. In addition, each potential subject was given the primary investigator's (PI) contact information and encouraged to contact her if they had questions or concerns. Subjects agreeing to take part in the study were asked to sign a consent form.

Sample: A sample size of 121 subjects was calculated using Cohen's power analysis.[24] The level of statistical significance was set at an alpha equal to .05, a power of .80 and a medium effect size (0.13).

Potential subjects were purposively recruited, on the day they received antenatal care, by nurses in the antenatal clinics of four public hospitals in northeastern Thailand. These hospitals were selected because of the large number of pregnant women they served each year The study's inclusion criteria were pregnant Thais who: were at least 35 years of age; had a gestational age between 25 and 36 weeks; were able to read and understand Thai; and, did not have a psychiatric diagnoses. Originally, 155 pregnant Thais were recruited. However, 13 of them were dropped from the study because they did not deliver at the one of the four public hospitals used as a study site. Thus, the finally number of subjects was 142.

The majority of the sample had an elementary school education (n = 74; 52.5%), a medium monthly income of 5,001 to 15,000 baht (n = 60; 42.3%) and a vaginal delivery (n = 74; 52.5%). Subjects, primarily, were: married (n = 136; 97.2%); multiparous (n = 120; 84.5%); non-smoking (n = 138; 97.9%); and, free from alcohol consumption during pregnancy (n = 134; 97.8%).

Instruments: Five instruments were used to obtain data. They included: a researcher developed Personal Characteristics Questionnaire (PCQ); a modified version of the Barrier and Benefit Scale (BBS),[25] referred to as the MBBS; the General Self-Efficacy Scale (GSES);[26] the Interpersonal Relationship Inventory questionnaire (IPRI);[27] and, a modified version of the Health Promotion Lifestyle Profile II scale (HPLP-II),[28] referred to as the MHPLP-II. Permission for use of all copyrighted instruments was obtained from the copyright holders. The GSES was available in the public domain. Except for the PCQ, all of the other questionnaires originally were written in English and required translation from English into Thai. Translation was carried out by an experienced

translator proficient in both Thai and English, who never saw the English versions of the instruments. To assure no changes in meaning occurred during the translation process, the Thai translated versions of the instrument were back translated into English and compared to the original English versions of the instruments. This process was carried out by two Thai nurse educators proficient in both English and Thai.

The PCQ obtained information about each subject's: level of education, income, parity, marital status, and smoking and alcohol activity during pregnancy. Data regarding maternal complications were obtained from the medical records of each subject.

Perceived benefits of and perceived barriers to health promoting behavior were measured via the modified BBS (MBBS). The BBS was modified, by the PI, based on Murdaugh's and Hinshaw's Preventive Behavior Model,[25] whereby the MBBS was designed to measure older pregnant Thais' perceived barriers of and benefits to undertaking health-promoting behaviors to modify risk factors that contribute to negative pregnancy outcomes. In addition, modifications made were done so that the scale also would be appropriate to the pregnancy-related behaviors and culture in Thailand. For example, the BBS item, "Annual checkups will help me learn my risk for heart disease," was modified to read "Visiting the doctor regularly during pregnancy can prevent complications." The MBBS consisted of 24 items that were rated on a 4-point Likert-type scale ranging from 1 = "strong disagreement" to 4 = "strong agreement." Twelve of the items related to perceived benefits, while 12 of them related to perceived barriers to health-promoting behaviors. One of the items used to measure the perceived barriers of health promotion was "It takes too much time to prepare and cook a healthy diet." An item that measured the perceived benefits to health promotion was "Keeping my heart cheerful can help my baby develop its emotional intelligence." Separate subscale scores were calculated for the perceived benefits and perceived barriers by summing the response scores across relevant items. The total possible score for each subscale ranged from 12 to 48. Higher scores indicated higher levels of perceived benefits and barriers to health promoting behavior. Internal consistency reliabilities for the perceived benefits and perceived barriers were found to be 0.739 and 0.890, respectively.

Perceived self-efficacy was measured by way of the 10-item GSES. The items were rated on a 4-point Likert-type scale ranging from 1 = "not at all true" to 4 = "exactly true." An example of an item on the GSES was "I can manage everything in my life." A total score, which could range from 10 to 40, was calculated by summing response scores across all items. A higher score indicated greater perceived self-efficacy. The perceived self-efficacy questionnaire was found to have a Cronbach's alpha coefficient of 0.878.

Social support was measured using the 13-item interpersonal social support subscale of the 39-item IPRI. The subscale had possible responses ranging from 1 = "strongly disagree" to 5 = "strongly agree." An example of an item related to social support was "I have someone who gives me helpful advice when I have problems." A total possible score, which could range from 13 to 65, was calculated by summing responses across the 13 items. A higher score indicated a higher level of perceived social support. The internal consistency reliability for the social support subscale was found to be 0.842.

Health promoting behaviors were measured via use of the modified HPLP-II. Item modifications were made, by the PI, based on Pender's Health Promotion Model,[29] for the purpose of addressing pregnancy-specific behaviors among older pregnant Thais, rather than the more general health behaviors measured by the original HPLP-II. For example, one of the modified items addressed asking the physician or nurse about prenatal testing for women 35 years of age and older, while another of the modified items asked about seeking advice from a physician or nurse regarding self-care when pregnant at an older age.

A modified item also was asked about pregnancy behavior, i.e. "I ask the physician or nurse to give me information about how to prevent complications during pregnancy." In addition, some of the original items, i.e. eating habits and exercise activity, were modified to be more appropriate for use within the Thai culture. The items had possible responses that ranged from 1 = "never do these behaviors" to 4 = "always do these behaviors." A total score, which could range from 52 to 208, was calculated by summing responses across items. A higher score indicated better health promoting behaviors. Internal consistency reliability for the scale was found to be 0.932.

Procedure: Following approval to conduct the study, potential subjects were identified, informed about the study and asked, by the nurses in the antenatal clinics used as the study sites, if they would be interested in taking part in the study. Once a woman consented to take part in the study, by signing the consent form, she was administered, in a private area of the antenatal clinic, the five study questionnaires. Upon completion of the questionnaires, the subjects were given a baby gift set as a token of appreciation for their involvement in the study. The day after a subject gave birth, the PI obtained data on the maternal outcomes (complications) from the woman's hospital record.

Data analysis: Demographic characteristics and scores for each instrument were determined using descriptive statistics. Pearson's product-moment correlation was used to compare continuous variables, while Spearman's Rho was used to compare ranked variables and continuous variables. Point-biserial correlation coefficient was used to compare discrete dichotomous variables and continuous variables. Stepwise multiple regression analysis was conducted to evaluate which maternal factors predicted the women's health promoting behaviors.[30]

Results

Subjects had high scores for perceived benefits of health promoting behaviors, levels of social support and health promoting behaviors (See **Table 1**). However, the findings indicated a moderate level of self-efficacy and suggested the women perceived several barriers to health promoting behaviors.

Table 1 Descriptive Statistics for the Perceived Benefits, Perceived Barriers, Perceived Self-efficacy, Social Support and Health Promoting Behaviors Scores (n=142)

Variables	*Mean (S.D.)* *Range*
Perceived Benefits	41.85 (4.29) (28-48)
Perceived Barriers	39.26 (5.07) (20-47)
Perceived Self-efficacy	29.11 (5.87) (13-40)
Social Support	50.68 (8.53) (16-65)
Health Promoting Behaviors	157.08 (21.43) (98-204)

Education level, perceived benefits to health promoting behaviors, self-efficacy and social support were significantly related to health promoting behaviors (see **Table 2**). Stepwise multiple regression indicated three predictors (self-efficacy, perceived benefits to health promoting behaviors and social support) of health promoting behaviors in the women (see **Table 3**). These three variables explained 49.3% of the variance.

Table 2 Correlations among Maternal Factors and Health Promoting Behaviors

Variables	*Health Promoting Behaviors*
1. Education	.190*
2. Income	.141
3. Parity	.102
4. Marital Status	.041
5. Smoking	.026
6. Alcohol Consumption	.107
7. Perceived Benefits of HPB	.375**
8. Perceived Barriers of HPB	.161
9. Self-Efficacy	.613**
10. Social Support	.534**

HPB = Health Promoting Behaviors; *p<.05; **p<.01

Table 3 Predictors of Maternal Health Promoting Behaviors

(n = 142)

Variables	*B*	*β*	*t*	*p*
Self-Efficacy	.296	.429	4.98	.000
Perceived Benefits of HPB	.252	.220	3.10	.002
Social Support	.141	-232	2.74	.007

HPB = Health Promoting Behaviors

Discussion

The fact subjects had high scores for perceived benefits of health promoting behaviors, levels of social support and health promoting behaviors suggested the women were knowledgeable regarding health promotion, perceived they were receiving adequate social support from spouses, and were engaging in health-related behaviors. Consistent with prior studies, the attention, support and concern the women, in this study, received from their spouses may have enhanced their motivation for good health behavior.[31-33] On the other hand, the findings of this study are incongruent with those of a previous study that indicated older primiparas experience limited family or social support.[34] However, similar to other findings,[35] some of the subjects did demonstrate poor health-promoting behaviors (i.e. low physical activity and low levels of stress management).

Consistent with the Patanavanichnun's findings,[35] subjects had moderate levels of self-efficacy and perceived several barriers to health promoting behaviors

which suggested they had moderate confidence in their ability to perform specific behaviors or cope with adversity. Also consistent with prior studies,[32] the women also perceived barriers to performing health behaviors (i.e. not wanting to get check-ups during their pregnancy) because of having to wait for a long period of time to see the physician, and feeling hesitant to ask the physician or nurse about how to take care of themselves during pregnancy.

Education level, perceived benefits to health promoting behaviors, self-efficacy and social support were found to be significantly related to health promoting behaviors. These findings suggested the women who had higher self-efficacy scores, perceived benefits of health promoting behaviors, and those who perceived having higher levels of social support tended to have higher health promoting behaviors.

The fact education level was found to be related to health promoting behaviors is consistent with previous studies that have indicated pregnant women with higher education levels were more likely to engage in health promoting behaviors[31, 36] One's level of education is known to influence decision-making, understanding of information, planning for healthy behaviors, and seeking opportunities that facilitate better health behaviors.[33, 37] In addition, higher education may help older pregnant Thais women better understand the advice given by health care providers and, perhaps, improve their levels of health promoting behaviors. Furthermore, having better education also offers more opportunities to access sources of knowledge that support health promoting behaviors.

The significant relationship found between perceived benefits of health promoting behaviors to health promoting behaviors is consistent with the tenets of Pender's Health Promotion Model,[21] which states the perceived benefits of actions have an influence on actions for health promoting behaviors. Perceived benefits of behaviors are based on personal or vicarious experiences of outcomes from prior experiences or observational learning from others engaging in the behaviors. Pregnant women who believe in the benefits of healthy behaviors may invest more time and resources in activities to increase their chances for healthy pregnancies. In addition, this finding is consistent with Panyapisit's study [32] wherein perceived benefits of health promoting behaviors were found to be a predictor of actual health promoting behaviors in mothers experiencing preterm delivery. In addition, other studies have demonstrated links between perceived benefits of health promoting behaviors and better health promoting behavior practices among pregnant thalassemia carriers, [38] and greater frequency of prenatal care visits among pregnant women. [39, 40] Furthermore, this finding supports the findings of a qualitative study that suggested perceived benefits of physical activity in pregnancy can influence pregnant women's engagement in physical activity.[41]

The significant relationship found between self-efficacy and health promoting behaviors was consistent with Pender's Health Promotion Model,[21] which states perceived self-efficacy influences action by affecting perceived barriers to health promoting behaviors and levels of commitment in pursuing a plan of action. People with high perceived self-efficacy have been found to have confidence in their ability to perform particular behaviors.[42] Therefore, those who have high self-efficacy are likely to seek information to prevent risk or change risk behaviors, and seek care during the onset of symptoms more often than those with low self-efficacy.[43] A study of first time pregnant women, 35 years of age or older, revealed that a high level of self-efficacy helped the women persist in their high-risk pregnancies and experience positive outcomes.[44] In addition, pregnant industrial workers have been found to be more likely to engage in health promoting behaviors if they had higher perceived self-efficacy for health promoting behaviors.[35] Finally, self-efficacy has been found to be positively correlated with increased exercise behaviors during pregnancy and greater frequency of prenatal visits.[39, 40]

The fact social support was found to be significantly correlated with health promoting behaviors suggested social support fosters health promoting behaviors. This finding is consistent with prior studies that have reported social support to be positively linked with health promoting behaviors in pregnant women.[33, 45]

Self-efficacy, perceived benefits of health promoting behaviors, and social support were found to predict 49.3% of the variance in the women's health-promoting behaviors. This finding was similar to prior studies that found perceived benefits of health promoting behaviors and social support predicted health promoting behaviors.[32, 38] The 50.7% residual in this study could not be explained based on the remaining factors examined, including the subjects': level of education, income, parity, marital status, smoking, alcohol consumption and perceived barriers to health-promoting behaviors. Thus, other factors within the theoretical framework of Pender's Health Promotion Model (i.e. prior-related behaviors, biological and psychological factors, and sociocultural factors) may help explain their health-promoting behaviors.

Limitations and Recommendations

Like all studies, there are limitations in this research that need to be noted. Although the number of subjects recruited exceeded the estimated sample size needed, subjects were purposively selected from four antenatal clinics housed within public hospitals located in northeastern Thailand and not all women being seen at the clinics were part of the study. Thus, the sample may not have been representative of older pregnant Thais. In addition, it is possible that those who volunteered to take part in the study gave different responses to the questionnaire items compared to the women who declined to participate. Future studies need to recruit samples from more diverse geographic areas throughout Thailand, especially rural areas, as well as from antenatal clinics housed in various types of hospitals. In addition, the measurement of all of the variables relied on self-report. Therefore, recall or other biases may have affected the reliability of the responses. In the future, researchers need to consider using a variety of measurement strategies, such as observation and video recordings of health promoting behaviors.

Conclusions

The findings of this study emphasize the importance of assessing, in older pregnant Thais, the presence of perceived benefits of health promoting behaviors, self-efficacy and social support. By so doing, nurses will be better able to more accurately identify older Thais who are at a greater risk for poor pregnancy outcomes. Once such women are identified it would behoove all health care providers to provide appropriate education and counseling to assist them in engaging in optimal health practices. The educational programs could include stress relaxation, meditation, appropriate physical activities and group sessions to foster social support. Since this study did not focus on interventions, future studies need to focus on the exploration of the types of nursing care and health services that may be most effective in promoting healthy behaviors in pregnant women who are 35 years of age or older.

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ปัจจัยทำนายพฤติกรรมส่งเสริมสุขภาพในหญิงตั้งครรภ์อายุ 35 ปีขึ้นไป

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บทคัดย่อ: การเปลี่ยนแปลงทางสังคมส่งผลให้หญิงชายไทยสมรสเมื่อพร้อมในอายุที่มากขึ้น ดังนั้น จำนวนหญิงตั้งครรภ์อายุมากกว่า 35 ปี จึงเพิ่มขึ้น หญิงตั้งครรภ์กลุ่มนี้มีโอกาสเสี่ยงต่อการเกิดภาวะแทรกซ้อนทั้งในมารดาและทารก การศึกษาถึงปัจจัยที่มีผลกระทบต่อภาวะสุขภาพของมารดาและทารกในหญิงตั้งครรภ์อายุ 35 ปีขึ้นไปยังมีจำกัด ดังนั้นการวิจัยครั้งนี้เป็นการวิจัยเชิงบรรยายมีวัตถุประสงค์เพื่อศึกษาความสัมพันธ์ระหว่างปัจจัยคัดสรรและพฤติกรรมส่งเสริมสุขภาพในหญิงตั้งครรภ์อายุมากกว่า 35 ปี

กลุ่มตัวอย่างถูกเลือกโดยการเจาะจงคุณสมบัติตามที่ระบุไว้จำนวน 142 ราย เป็นหญิงตั้งครรภ์อายุ 35 ปีขึ้นไปที่มารับการฝากครรภ์ โรงพยาบาลรัฐบาลในภาคตะวันออกเฉียงเหนือจำนวน 4 แห่ง เก็บรวบรวมข้อมูลโดยใช้แบบสอบถาม ปัจจัยส่วนบุคคล การรับรู้ประโยชน์และการรับรู้อุปสรรคของการปฏิบัติพฤติกรรมส่งเสริมสุขภาพ การรับรู้สมรรถนะของตนเอง การสนับสนุนทางสังคม และพฤติกรรมส่งเสริมสุขภาพ ส่วนข้อมูลภาวะสุขภาพของมารดาและทารกรวบรวมจากแบบบันทึกทางการแพทย์และการพยาบาลของกลุ่มตัวอย่างแต่ละราย

ผลการศึกษาพบว่าระดับการศึกษา การรับรู้ประโยชน์ของการปฏิบัติพฤติกรรมส่งเสริมสุขภาพ การรับรู้สมรรถนะของตนเอง และการสนับสนุนทางสังคม มีความสัมพันธ์กับพฤติกรรมส่งเสริมสุขภาพ

ผลการวิเคราะห์ถดถอยพหุคูณแบบขั้นตอนพบว่าการรับรู้สมรรถนะของตนเอง การรับรู้ประโยชน์ของการปฏิบัติพฤติกรรมส่งเสริมสุขภาพ และการสนับสนุนทางสังคม สามารถร่วมทำนายพฤติกรรมส่งเสริมสุขภาพของหญิงตั้งครรภ์อายุมากกว่า 35ปีได้ร้อยละ 49.3 ดังนั้น พยาบาลควรจัดกิจกรรมส่งเสริมให้หญิงตั้งครรภ์มีการรับรู้สมรรถนะของตนเอง และการสนับสนุนทางสังคม ร่วมกับให้ความรู้ถึงประโยชน์ในการปฏิบัติพฤติกรรมส่งเสริมสุขภาพ เพื่อให้หญิงตั้งครรภ์อายุมากมีภาวะสุขภาพที่ดีทั้งมารดาและทารกต่อไป

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